



NATIONAL ESTUARINE RESEARCH RESERVE ASSOCIATION

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**Testimony of the
National Estuarine Research Reserve Association**

**Submitted to the
Committee on Commerce, Science, and Transportation
U.S. Senate**

S. 360, the Coastal Zone Enhancement Reauthorization Act of 2005

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Introduction

Since 1987, NERRA has been dedicated to science-based management of our nation's estuaries and coastal systems, and serves as the primary advocate for the National Estuarine Research Reserve System (NERRS), a network of 26 (soon to be 27) regionally-based programs representing diverse estuarine and coastal ecosystems throughout the United States and its territories. Through a state-federal partnership codified in the Coastal Zone Management Act (CZMA), reserves play a critical role in national efforts to sustain healthy estuaries and coastal communities. National Estuarine Research Reserves support science-based coastal management through long-term research, monitoring, education, and stewardship.

National Estuarine Research Reserve System (NERRS)

The National Estuarine Research Reserve System (NERRS), established under section 315 of the CZMA, is designed to promote informed coastal decisions through site-based estuarine research, education, and stewardship. NERRS sites have been selected on the basis of biogeographic regions that share geophysical and biological characteristics. Coastal states are responsible for management of reserve sites, in cooperation with the National Oceanic and Atmospheric Administration (NOAA).

Since the enactment of the CZMA in 1972, 26 estuaries have been designated as part of the reserve system including Alaska and Puerto Rico, with an additional site in Texas expected to be designated later this year. Reserves serve as regional centers of excellence where coastal communities can access a broad array of coastal products and services, including: (1) training to promote informed environmental decision-making; (2) a national monitoring program for estuaries is maintained; and (3) education opportunities are provided to students and the public. With these key elements, the reserve system is in the unique position of serving the national interest while responding to local needs.

In addition, the reserve system is poised to help carry out the recommendations of the U.S. Commission on Ocean Policy. The Commission recommended that effective policies be based on unbiased, credible, and up-to-date scientific information. The Commission stated that this will require a significant investment in coastal and ocean research and monitoring and the ability to translate scientific findings into useful information products for coastal decision makers. The reserve system not only conducts scientific research and estuarine monitoring, but provides training opportunities to help inform coastal decision making. The Commission also recommended that there is an urgent need to strengthen the nation's coastal and ocean literacy, including improving decision makers' understanding of the coasts and oceans, preparing a new generation of leaders on ocean issues, and cultivating a broad public stewardship ethic. Through the NERRS education and training programs, the system is well-suited to meet these goals.

Estuaries—dynamic regions where rivers meet the sea—constitute an important interface between land use and coastal resources. Considered to be among the most biologically productive ecosystems on Earth, healthy estuaries are essential to the preservation of robust coastal communities. Estuaries support vital nurseries for economically important fish and shellfish, provide essential habitat for wildlife, create opportunities for ecotourism, and serve as ports for maritime commerce. The NERRS and Coastal Zone Management Programs contribute

to the informed use of these estuarine-dependent resources through an integrated program of research, education, and stewardship, as well as implementation of state coastal zone management plans.

Local and regional land use decisions continue to contribute to degradation of water quality and loss of wetland habitat. Land use in watersheds, ranging from agriculture and development to water resource allocation and flood control, are becoming increasingly important factors for coastal and estuarine management. Local elected officials, land use planners, government agencies, and agricultural interests are often asked to make land use decisions without sufficient information regarding the potential consequences to downstream effects.

To meet these challenges, the NERRS have developed several system-wide programs to place reserves in a strong position to detect environmental change, respond to pressing research needs at the local and regional scale, and to provide technical training for the coastal stakeholder community:

- The NERRS System-Wide Monitoring Program is designed to provide standardized monitoring and assessment capabilities at each reserve to detect changes in water quality, biological indicators, and land use change at the watershed scale.
- The NERRS Graduate Research Fellowship Program supports two graduate research projects at each reserve annually on coastal management topics of concern to local and regional stakeholders. Research topics range from stormwater management and restoration ecology to invasive exotic plants and fishery habitat requirements.
- The NERRS Coastal Training Program target individuals involved in local planning and management. Training activities provide science-based information on topics responsive to local needs such as polluted runoff, watershed management, water supply, and restoration science.

Education and Training

Coastal Training Program

One of the most significant challenges in managing the nation's coasts today is the need to link science-based information to local coastal communities. Decisions made by coastal communities can have profound, long-term consequences for estuarine and coastal environments. Elected officials, land use planners, regulatory personnel, coastal managers, and agricultural and fisheries interests are key decision makers who often do not have adequate access to relevant science-based information, training, or available technology to make informed decisions affecting the coast. Building on past success with services for coastal decision-makers, the NERRS has developed the Coastal Training Program to fill this need.

The Coastal Training Program provides the best available science-based information, tools, and techniques to individuals and groups that are making important decisions about resources in coastal watersheds, estuaries, and nearshore waters. Programs have taken the form of workshops, seminars, distance learning, technology applications and demonstrations. Opportunities for information exchange and skill training are expanding coastal management networks and collaboration across sectors, and improving local understanding of the environmental, social, and

economic consequences of human activity in the coastal zone. These programs also make use of field experiences, relevant research and monitoring, and facilities provided by the reserves.

The Coastal Training Program was designed to increase the current capacity of reserves to deliver technical training services to under-served constituent groups. Reserve staff continue to work closely with state coastal programs and others to identify critical issues in the region and key coastal decision-makers that could benefit most from relevant science and training. Coastal Training Program participants have included state and local elected and appointed officials, agency staff, volunteer boards, members of NGOs, business organizations, and state and regional professional associations whose daily decisions impact coastal resources.

Reserve staff are implementing the Coastal Training Program in partnership with national and local organizations. At the national level, NOAA's Estuarine Reserves Division provides strategic and budget planning and support in partnership with NOAA's Coastal Management Programs, Sea Grant, and the Coastal Services Center. At the local and regional levels, individual reserves are developing Coastal Training Program partnerships with state coastal programs, Sea Grant programs, local universities and researchers, professional organizations, local government agencies, non-profit organizations, and a variety of others with expertise, skills, training sites, and logistical support.

K-12 Estuarine Education Program

During 2004, reserves engaged over 80,000 students in K-12 education programs, and 3,000 teachers in professional development programs. EstuaryLive alone—an annual interactive virtual field trip designed to increase students understanding about estuaries—engaged 13,600 students and teachers during the broadcast. As recommended by the U.S. Commission on Ocean Policy, there is an urgent need to strengthen the nation's coastal and ocean literacy. With a coordinated network of educators, the NERRS is positioned to increase public awareness about estuaries and coastal systems. Building on site-based education efforts, the NERRS is developing a system-wide K-12 education program. This program would allow the reserve system to network more efficiently across the country, generate and disseminate educational products that use data generated by ocean observing systems to the K-12 community, share and exchange resources, and enhance efforts to incorporate ocean and coastal science into local curricula.

Research and Monitoring

Graduate Research Fellowship Program

Estuaries are highly variable, complex systems where the variability in water movement, water quality, habitat, and human use vary over a wide variety of spatial and temporal scales. Because of this variability, it is often difficult to separate natural change from those changes influenced by human use of our coasts and estuaries. Two approaches are necessary to address this issue. First, targeted research is needed to determine the cause and effect relationships of human influence on estuarine variability, and second, a long-term monitoring program is needed to characterize the natural variability that governs the structure and function of estuarine systems. The reserve system has begun building the capability to meet these management needs.

The NERRS is addressing the first need through the Graduate Research Fellowship program where students across the nation compete to work on priority needs of the coastal management community.

Up to fifty-two graduate students per year receive support from this program and present results of their research at national, regional, and local meetings where information is transferred to other researchers, coastal managers, and those individuals responsible for making daily decisions with respect to our coastal and estuarine resources.

In addition to the graduate research program, reserve sites are being actively promoted as sites for long-term research by many granting agencies such as the National Science Foundation, Environmental Protection Agency and, of course, NOAA. This promotion directs researchers from throughout the country to conduct long-term studies in estuarine research reserves.

System-wide Monitoring Program

With respect to the second need, that of a long-term, estuarine monitoring capability, the NERRS operates the *only* national monitoring program for estuaries in the United States. In 1995, the NERRS established the System-wide Monitoring Program. This program is designed to identify short-term variability and long-term trends and changes in coastal ecosystems, including locations that span the range of coastal environments from estuaries and coastal waters to watersheds. The program focuses efforts on three critical areas: estuarine water quality; estuarine biodiversity; and estuarine land use and habitat change.

The System-wide Monitoring Program provides valuable long-term data on water quality and weather at frequent time intervals. Coastal managers use this monitoring data to make informed decisions on local and regional issues, such as “no-discharge” zones for boats and measuring the success of restoration projects. Periodic syntheses of data are expected to serve as one of the mechanisms by which coastal managers can inform their decision-making responsibilities. In addition to serving regional research and coastal management needs, the System-wide Monitoring Program is designed to enhance the value and vision of the 26 reserves as a system of national references sites.

Future efforts will focus on the expansion of biological monitoring at all reserves and tracking habitat and land use changes through remote sensing techniques. Expansion of the SWMP effort is aimed at adding to the current system of environmental observations made at reserves. This will be addressed through spatial expansion of the monitoring system, and the addition of new monitoring parameters such as nutrients. When fully implemented, the System-wide Monitoring Program will provide valuable long-term, integrated data on water quality, weather, biota, land use, and habitat change within the National Estuarine Research Reserves.

All numerical data sets collected by the System-wide Monitoring Program are compiled, subjected to a rigorous quality assurance protocol, and the database and associated metadata are submitted to the NERRS Centralized Data Management Office at the University of South Carolina Belle W. Baruch Institute of Marine and Coastal Sciences. Following final quality assurance, the Centralized Data Management Office disseminates all system-wide data and

summary statistics over the World Wide Web (<http://inlet.geol.sc.edu/nerrscdmo.html>) where researchers, coastal managers, and educators readily access the information.

The water quality and meteorological monitoring components of the System-wide Monitoring Program have been recognized as a fundamental backbone element in the national Integrated Ocean Observing System (IOOS) framework, and the reserve system is currently developing and testing near real time data delivery systems that include real time data quality control.

Resource Stewardship

In addition to research, monitoring, education, and training, reserves are developing resource stewardship and coastal restoration programs that address both site-specific and watershed-scale information needs. Resource stewardship is an essential component of the NERRS mission and ensures that site conditions remain suitable for long-term research and education programs. Stewardship activities include the eradication of exotic species, restoration of natural hydrologic processes, and the conduct of prescribed burns in fire-dependent plant communities. NERRS staff also has built strong partnerships with local agencies, organizations, and landowners to develop watershed management strategies, and Best Management Practices that mitigate disturbance to water quality and habitat structure.

Partnerships

The NERRS enjoy a strong relationship with its federal partner, the National Ocean Service at NOAA. The state-federal partnership, a hallmark of the NERRS, is strong. NOAA has been increasing its service to the NERRS, especially training, materials, and assistance with site profiles from the Coastal Service Center, and providing opportunities for the reserves to play a larger role in coastal science programs at the agency.

Reserves also leverage significant resources on behalf of coastal research, education, and management through partnerships with government agencies at local, regional, and federal levels, private industry, and academia. For example, the Hudson River Reserve received approximately \$2 million in funding from the state of New York, Columbia University, and the Hudson River Foundation to characterize the benthic habitat of the Hudson River. The Jacques Cousteau Reserve received more than \$1 million from federal, state, and private sources to investigate coastal processes at a Long-term Ecosystem Observatory, and to develop science enrichment programs for the precollegiate community based on this field program. At the Elkhorn Slough Reserve, a partnership with the Elkhorn Slough Foundation, National Audubon Society, and the Monterey County Planning Department is gathering critical resource information for a regional watershed plan. The plan will be used to guide future land use in the watershed surrounding the reserve.

Reauthorization of the CZMA

Reauthorization of the CZMA provides an opportunity to strengthen the capabilities of coastal communities to address issues of coastal development, protection, and habitat restoration. Of particular importance to the NERRS, is the framework provided by the CZMA to meet the need for informed decision-making at the federal, state, and local levels.

Amendments to the Act should:

- Provide effective mechanisms to assess the technology and information needs of coastal communities at local and regional scales;
- Strengthen the capacity of the state-federal partnership to support research and monitoring relevant to local and regional needs; and
- Improve the access and delivery of science-based information to coastal communities, and evaluate the performance of the state-federal partnership in support of informed coastal decisions.

Specifically, NERRA offers the following recommendations in support of reauthorization of the Coastal Zone Management Act.

NERRA fully supports that S. 360, the *Coastal Zone Enhancement Reauthorization Act of 2005*, better reflects the mission of the reserve system as a network of protected areas established for long-term research, education, and stewardship. We want to ensure that the final language provides adequate authority for NERRS' research and monitoring, education and training, and stewardship programs.

We would respectfully request that the Committee include language in the Congressional Findings section of the bill that specifically addresses the purpose and need for a national system of estuarine research reserves. Such language should express that the reserve system will provide for protection of essential estuarine resources, as well as for a network of state-based reserves that will serve as platforms for coastal stewardship best-practices, monitoring, research, education, and training to improve coastal management and to help translate science and inform coastal decision makers and the public.

We also suggest that NERRA's vision of having a reserve in every coastal and Great Lakes state be incorporated into the bill, rather than only the current requirement that a reserve contribute to the biogeographical and typological balance of the reserve system. While it is important that new reserves contribute to the biogeographic representation of the system, having a reserve in every coastal and Great Lakes state would provide the coastal training, education, research, and monitoring opportunities the reserve system offers to each state and each state's coastal program.

With respect to the authorization of appropriations section, NERRA recommends that for grants under section 315, the bill include a reauthorization beginning at \$22 million and increasing by \$1 million per year to accommodate new sites, expansion of products and services, and cost of living increases. An authorization at this level would allow the NERRS to add new reserves into the system, enabling us to work toward our vision of having a reserve in every coastal and Great Lakes state, and would allow the NERRS to expand core programs or more fully develop them, such as the K-12 Estuarine Education Program.

NERRA endorses incorporation of funding for construction projects into the reauthorization measure, as stated in S. 360, but would ask the Committee to include acquisition projects as well. This would better reflect our current appropriations, which have been to support both

construction and acquisition projects. The NERRS have established procedures for setting priorities for construction and land acquisition, and recently assembled long-term plans to meet construction and land acquisition needs. Incorporation of funds for these purposes into the CZMA will provide a stable, long-term source of funding for the NERRS to maintain facilities in support of research, education, and stewardship programs, as well as to acquire priority land and water areas for watershed management.

Conclusion

NERRA is very supportive of S. 360 and appreciates the Committee's interest in reauthorizing the Coastal Zone Management Act. NERRA is ready to work with you in any way to support passage of S. 360. We would be pleased to provide further information or answer any questions you may have. Please do not hesitate to contact the NERRA Executive Director, Angela Corridore (acorridore@sso.org or 202-508-3836), with any questions.